

## **Claims**

What is claimed is:

- 1) An interactive system, comprising:  
a component to assess reliability of a communication; and  
a component to infer a probability associated with an intent of the communication.
- 2) The system of claim 1, further comprising:  
a component for taking an action based upon the inferred probability to facilitate achieving a communicative intention.
- 3) The system of claim 2, wherein an immediate action is taken if the communicative intention is achieved.
- 4) The system of claim 2, wherein the action is at least one of a clarification action or a domain-level action.
- 5) The system of claim 2, wherein the actions are determined from a confidence threshold associated with an expected utility.
- 6) The system of claim 4, wherein the domain-level action includes at least one of engage, disengage, enable and disable.

- 7) The system of claim 4, wherein the clarification action includes at least one of asking user to repeat utterance, note a recognition of a users hesitation and try again, note a reception of a noise and inquire, getting the users intention, apologizing for an interruption and forgoing the action, engage troubleshooting regarding the clarification action.
- 8) The system of claim 1, wherein the intent of the communication is associated with at least one of acknowledgement, negation, reflection, unrecognized response, and no response.
- 9) The system of claim 8, wherein a plurality of candidate utterances are defined for each intention.
- 10) The system of claim 8, wherein the intent of the communications is influenced by the reliability of the communications.
- 11) The system of claim 10, wherein the reliability of communications are at least one of related to noise and background input levels associated with the communications.
- 12) The system of claim 9, wherein the plurality of candidate utterances are analyzed according to a Bayesian network model, the model is determined over different instances of time to probabilistically infer a communicators intent.
- 13) The system of claim 1, further comprising an animated agent to interact with a communicator to determine the communicator's intent.
- 14) The system of claim 13, wherein the animated agent is at least one of a helper, a wizard, and a genie.

- 15) The system of claim 13, further comprising the animated agent provides services relating to synchronization of contacts, appoints, and tasks, associated with at least one of an e-mail, scheduling, calendaring, and planning service.
- 16) The system of claim 1, further comprising a development tool that is utilized for a plurality of command and control domains.
- 17) A method for interactive communications, comprising:  
assessing reliability of a communication; and  
inferring probability associated with an intent of the communication.
- 18) The method of claim 17, further comprising:  
taking an action based upon the inferred probability to facilitate achieving a communicative intention.
- 19) The method of claim 18, wherein an immediate action is taken if the communicative intention is achieved.
- 20) The method of claim 18, wherein the action is at least one of a clarification action or a domain-level action.
- 21) A computer readable medium having instructions stored thereon for performing the acts of claim 13.

- 22) An interactive system, comprising:
- a first component for analyzing sequential communications including speech, gestures and other modalities related to an underlying communicative intention, the component concurrently employing at least two of the communications in determining an action to facilitate achieving the intention; and
  - a second component to perform the action if the underlying communicative intention is above a confidence threshold.
- 23) A method to determine communicative uncertainty, comprising:
- inferring a probability that a user desires a service;
  - performing a cost-benefit analysis to determine whether a dialog with the user is above a predetermined expected utility; and
  - engaging a user with a question about the desires of the service according to the expected utility.
- 24) The method of claim 23, further comprising listening over time to determine whether an utterance heard is greater than a confidence threshold.
- 25) The method of claim 24, further comprising displaying a sign of understanding and performing an action if the utterance heard is greater than the confidence threshold.
- 26) The method of claim 24, further comprising displaying a sign of misunderstanding if the utterance heard is below the confidence threshold.
- 27) The method of claim 24, further comprising offering troubleshooting information if the utterance heard is below the confidence threshold.

- 28) A system to determine communicative uncertainty, comprising:  
means for inferring a probability that a user desires a service;  
means for performing a cost-benefit analysis to determine whether a dialog with the user is above a predetermined expected utility;  
means for engaging a user with a question about the desires of the service according to the expected utility.
- 29) The system of claim 28, further comprising means for listening over time to determine whether an utterance heard is greater than a confidence threshold.